

REMARKS

Reconsideration and allowance of the subject application are respectfully requested.

Claims 1, 2 and 4-11 are pending in the application.

Basis for new claims 9-11 can be found in the specification including at original claims 6-9. Claims 2 and 5 have been amended to be independent form by incorporating the subject matter of base claim 1. No new matter has been added.

The objection to claims 1, 3 and 5 on page 2 of the Office Action is obviated by the amendment set forth above. No new matter has been added. The amendments correct very minor typographical and spelling errors and do not alter the breadth of the claims. No claims have been amended to overcome prior art. Thus, the doctrine of equivalents applies to each and every claim limitation.

Applicant respectfully submits that the obviousness type double patenting rejections on pages 3-5 of the Office Action over U.S. Patent Nos. 6,334,300 (the '300 patent) and 6,490,854 (the '854 patent) are improper in view of the previous Restriction Requirement issued by the present Examiner and, thus, should be withdrawn. In Applicant's '300 patent app'n ser. No. 09/680,468, the Examiner issued a Restriction Requirement on April 30, 2001 between Group VI, a compressed gas driven generator (the present application); Group II and VII, a method of operating an external combustion engine (the '300 patent application); and Group I, an external combustion engine (the '854 application). Since the present application is a proper Divisional Application of the '300 and '854 patents pursuant to a Restriction Requirement, issuance of Double Patenting Rejections is prohibited under 35 U.S.C. § 121. Accordingly, withdrawal of the double patenting rejections is respectfully requested.

The rejection of claims 1, 3 and 4 under 35 U.S.C. § 103 over Leidel in view of Viteri and Van Arsdel is respectfully traversed. The claimed invention is not obvious over the theoretical combination of references for the following reasons.

The Examiner admits that Leidel does not disclose the use of natural gas as fuel,

nor powering an electrical generator. The Examiner argues that Viteri teaches to use natural gas as a fuel and that Van Arsdel teaches to drive a generator. The Examiner further argues that the line which feeds high pressure natural gas to the combustion chamber is readable as a high pressure main line.

Applicant respectfully submits that one of ordinary skill in the art would not be motivated to combine the cited references as alleged by the Examiner. The present invention relates to a static location electrical generator that utilizes the large compressive energy of pressurized natural gas in the high pressure main line. The natural gas high pressure main line is well known as a pipe that transfers natural gas from a public utility to a home or business at pressures of about 3500 psi and higher. In contrast, each of the references cited by the Examiner relate to automobiles. Automobiles are not held in a static location and mounted to natural gas line. These teachings are opposing. For this reason alone, the Section 103 rejection should be withdrawn.

Even if the references were combined, the claimed invention would not be taught or suggested such a theoretical combination for the following reasons.

Each of claims 1, 3 and 4 require the step of "supplying compressed natural gas from a high pressure main line to a combustion chamber." The high pressure main line is the well known main line that supplies natural gas from a public utility to a home or business at pressures of about 3500 psi or higher. See pages 19-23 of the present specification, which describe the electrical generator according to the presently claimed invention. Applicant is using the term "high pressure main line" in its common every day usage, i.e. as the main line from a utility to a home or business. The specification does not alter this meaning. Thus, it is improper to alter this common meaning and now interpret the "high pressure main line" as some conduit found within an automobile. When the term high pressure main line is properly interpreted according to the case law to have its common meaning, the cited references clearly do not disclose using such. One would not connect an automobile to a static high pressure main line, since it would defeat the purpose of an automobile, i.e. transportation versus static location. For this

reason alone, the Section 103 rejection should be withdrawn.

Leidel at Fig. 2 and paragraph 4 teaches to use a fuel pump to impose pressure on the non-pressurized stored fuel. This specifically indicates the use of a liquid-based fuel. Leidel only teaches to use liquid fuel and to pressurize the liquid fuel using a fuel pump 44 and spray it through a nozzle 53 in an external combustion motor. Leidel discloses a sophisticated control system based on the liquid fuel for use in a motor vehicle without mention of an electrical power generation. Thus, Leidel teaches away from the present invention, which uses a compressed gas use.

In contrast, the claimed invention recovers the potential energy of the highly compressed natural gas by not decompressing the natural gas before introducing it into the combustion chamber. There is no teaching of Leidel on how to recover the potential energy of the high pressure compressed natural gas.

Neither of Viteri or Van Arsdel supply the deficiencies of Leidel. Viteri and Van Arsdel do not teach or even suggest how to recover the large potential energy of the highly pressurized natural gas.

Furthermore, none of the cited references discloses structure for connecting to a fixed high pressure main line and regulating the flow therefrom and thus, the combination also cannot teach such. All of the references disclose engines for use in vehicles and, thus, would not disclose or teach structure for connecting a fixed high pressure main line such that the step of supplying pressurized gas from a high pressure gas main to the combustion chamber can be practiced.

Leidel does not indicate the use of the pressurized fuel to drive the motor assembly and the subsequent motor and generator application. In his abstract, Leidel also specifically indicates use as an automotive powerplant, not an electric generator. Leidel expounds on fuel injection with detail and a crosshead shaft seal with detail. He utilized a fuel tank (non-pressurized) in conjunction with a fuel pump. This configuration clearly communicates the utilization of a liquid, not gaseous fuel like compressed natural gas. These main teachings of Leidel will be destroyed by replacing the liquid fuel with a gaseous fuel. For this reason alone, Leidel cannot be modified to use a

gaseous fuel.

Van Arsdel teaches a hot gas storage tank connected to a combustion chamber to receive burned gasses subsequent to ignition. Van Arsdel uses a fuel tank (implying a non-pressurized liquid fuel) in connection with a fuel pump (once again implying a non-pressurized liquid fuel use). Van Arsdel does not reclaim pressurized energy stored as a pressurized gaseous fuel.

Van Arsdel teaches that the “[m]otor 36 is connected via line 28 to a standard fuel pump 43 which is connected to the fuel tank.” (column 3, lines 5-7 of U.S. No. 3,867,812). Non-pressurized liquid fuel requiring the input of energy in order to pressurize said fuel for utilization is communicated. Furthermore, Van Arsdel references “the flow of a fuel such as gasoline from the fuel tank...” (column 3, lines 8-10 of U.S. No. 3,867,812), once again teaching in a direction away from that of the current invention.

Van Arsdel does disclose that “[m]any fuels in lieu of gasoline may be provided within tank 42, such as propane fuel.” (column 3, lines 11-13 of U.S. No. 3,867,812) This disclosure implies a liquefied fuel and the continued use of a fuel pump requiring energy input and non-utilization/recovery of the pressurized energy contained by the propane fuel storage tank. In light of this teaching, one of ordinary skill in the art would understand that the pressure associated with Van Arsdel’s specified propane is very different from the present invention’s highly-pressurized (3500-4000 psi) compressed natural gas high pressure vessel.

Van Arsdel discloses the “use of a gas motor in lieu of an internal combustion engine allows for the elimination of the transmission, clutch and differential making possible over-slung axles for military vehicles.” (column 5, lines 10-13 of U.S. No. 3,867,812). Thus, Van Arsdel clearly teaches a vehicle.

Van Arsdel does mention that “[g]as motor 157 is utilized to operate generator 158 which is connected by line 159 to the battery for the recharging of the battery.” (column 5, lines 57-59 of U.S. No. 3,867,812). However, Van Arsdel does not specify the use of a gas motor connected to an electrical generator for electricity generation for

use in an external application to the engine as the present invention teaches. Continuing along these lines, Van Arsdel states "FIG 6 is an illustration of an automobile having the power system of FIG 4." (column 7, lines 1-2 of U.S. No. 3,867,812) This is a specific automobile reference and is followed in his text by numerous other automobile references, thus teaching away from, and excluding by omission, static electrical power generation according to the present invention. Viteri discloses a low or no pollution engine for delivering power for vehicles or other power applications. Air is scrubbed to be "substantially entirely oxygen". Hydrogen is specifically indicated as the fuel source as indicated in Viteri's claims: Claim 1 "A hybrid engine with electric motor drive in parallel with a non-polluting regenerative Rankine cycle engine using as the working fluid the products of complete combustion of oxygen and a hydrocarbon or simple alcohol (i.e. methanol or ethanol), (a diversion from hydrogen to a liquid fuel) combined with a water quench, said hybrid engine comprising: an electric motor means connected to a power transmission means, said electric motor means receives its electric current from a battery means, said battery receives its electric current from an alternator means, said alternator is driven by a dynamic turbine means;" and Viteri's claim 2 "A low or no pollution emitting combustion engine to provide power for various applications such as vehicle propulsion, the engine comprised in combination:" as well as Viteri's claim 16 "A combustion engine providing clean power for various applications and featuring low NO_x production."

Viteri teaches separating and using oxygen while the present invention utilizes air. Viteri details an air treatment device with specific reference to a scrubber, rectifier, expander, condenser, intercooler, oxygen compressor and a nitrogen removal means. Viteri's configuration does not lend itself to electrical power generation (continuous operation, due to its multiple rotational kinetic to alternator electric to battery storage to electric motor application energy conversion). Electrical power generation for external use would require modifications to Viteri, such as replacing the alternator, rectifier and battery pack with an electrical power generator.

Viteri teaches that his "invention contains environmentally clean engine designs that emit zero or very low pollutant levels during operation. The CLEAN AIR ENGINE (CLAIRE) invention is directly applicable to transportation type vehicles including automobiles, trucks, trains, ships and stationary stand by power generation applications." Viteri also states that "[t]he current art in generating power for transportation purposes basically utilize the internal combustion gas for diesel engine." Viteri does not disclose electrical power generation as recited by the present invention.

Viteri details emissions (pollutants) considered damaging to our environment including: total organic gasses (TOG), reactive organic gasses (ROG), carbon monoxide (CO), oxides of nitrogen (NO_{sub.x}), oxides of sulfur (SO_{sub.x}) and particulate matter (PM). In general, Viteri takes the hybrid vehicle popular today and attaches an air to oxygen purification/compression device in an attempt to create a "zero-pollution vehicle (ZPV) and other transportation power systems (i.e. rail and ship)." (paragraph 1, first sentence).

In no manner does Viteri teach or even suggest electrical power generation. Viteri only teaches producing electricity exclusively for internal engine utilization and storage. Viteri does not teach electrical power generation for external usage.

Viteri obviously communicates other modes of transportation quoting "vehicular and other applications," (first sentence of abstract) not electrical power generation by an electric generator for external use. Viteri discloses that "[f]uel, i.e. methane, propane, purified natural gas and light alcohols such as methanol and ethanol, exits the fuel tank 239 through duct 241 and enters the compressor 242 of turbo expander 250 and is raised to the design discharge pressure." (6th embodiment, 9th to last paragraph within same embodiment). While Viteri broadly mentions various potential fuel sources, he explicitly eliminates highly compressed gaseous fuels, in particular, compressed natural gas, to his embodiment configurations through use of a compressor. Compressed natural gas stored at 3500 to 400 psi does not require a compressor. Thus, Viteri teaches away from the claimed invention.

No combination of cited references teaches or even suggests electrical power

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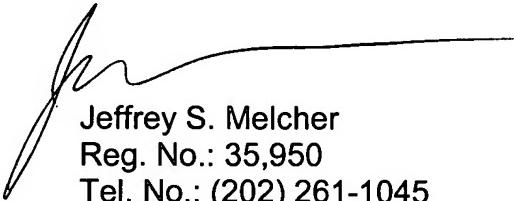
generation in a static location that utilizes the large potential energy of a highly compressed gas in a high pressure gas main line.

In view of the improper combination of references, the many differences between the claimed invention and the theoretical combination of references, and the unexpected advantages of the claimed invention, withdrawal of the Section 103 rejection is respectfully requested.

Applicant respectfully submits that all of the objections and rejections of record have been addressed and the application is condition for allowance. Notice to that effect is respectfully requested.

Respectfully submitted,
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